UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,084	01/16/2004	Mikiko Abe	71801 CCD	1283

7590 11/20/2007

c/o Cooper & Dunham LLP
1185 Ave. of the Americas
New York, NY 10036

EXAMINER	
ANGEBRANNDT, MARTIN J	
ART UNIT	**PAPER NUMBER**
1795	

MAIL DATE	DELIVERY MODE
11/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/760,084	ABE ET AL.	
	Examiner	Art Unit	
	Martin J. Angebranndt	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/4/2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-6 and 9-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-6 and 9-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The response of the applicant has been read and given careful consideration. Rejections of the previous office action are withdrawn based upon the amendments and arguments of the applicant. Responses to the arguments of the applicant appear after the first rejection to which it is directed. The applicant has perfected priority through the certified translations provided.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Please insert - - further- - before comprises to make it clear that the titanium oxide is a further component.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1,2,4-6, 9-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onaki et al. JP 2002-260283, in view of Ebina et al. JP 10-055539 and either (Nobukuni et al. '407 or Harigaya et al. EP 1260973).

Onaki et al. JP 2002-260283 (machine translation attached) teaches in example 2, a substrate with a 65 nm ZnS- Nb_2O_5 lower protective layer, a 5 nm second lower dielectric layer of $(ZrO_2)_{80}$ $(Nb_2O_5)_{20}$, a 15 nm $In_5Sb_{62}Te_{30}Ge_3$ recording layer, a 16 nm dielectric layer of $(ZrO_2)_{80}$ $(Nb_2O_5)_{20}$, a AgCu reflective layer of 150 nm. Examples 4 uses ZrO_2-MgO [0087], example 5 uses ZrO_2-CaO [0090]. The use of a bilayer lower dielectric protective layer, where

the layer closest to the recording layer acts as a barrier layer and zirconia materials are preferred [0041,0047-0048]. Another example uses ZrO_2-Y_2O_3-TiO_2 [0093]. The use of zirconia stabilized using various materials is disclosed. [0019,0068].

Ebina et al. JP 10-055539 in example 1 teaches a grooved substrate coated with a 150 nm ZnS-SiO_2 lower protective layer, a 25 nm $Sb_2Te_5Ge_2$ recording layer, a 50 nm ZnS-SiO_2 upper protective layer, a 100 nm Al reflective layer [0016]. This was initialized with a power density of 17.5 mW/ μm^2 at a linear velocity of 8.0 m/s with an advance of 48 microns. [0017].. The laser beams used was a 100 x 1 micron oval laser beam (area being 78.5 μm^2 [0017]. The use of the medium at velocities of 8.4 m/s is disclosed. [0017]. The use of velocities of 3-12 m/s is disclosed/ [0009]. The use of power densities of 7.5-20 mW/ μm^2 is disclosed [0010]. The use of various phase change recording layers including InSbTe and GeTeSb recording layers is disclosed [0014]. The power of the laser is varied inversely with speed.

Nobukuni et al. '407 teaches example 1, which has a InGeSbTe recording layer and is initialized at 3-4 m/s and a power of 600-700 mW over an area of 71.4 μm^2 . The power is ~ 9.8 mW/ μm^2. [0549]. The use of the medium at 10 times velocity is taught (~12.0 m/s). [0556-0572]. The general use of GeTeSb and InGeSbTe recording layers is disclosed [0160,0166,0179]. Example 11 teaches the initialization of the media at 2, 2.5, 3, 7 and 10 m/s at powers of 500 to 1500 mW with a laser beam which has an area of 102.0.5 sq. microns. The power/area is 14.69 mW/sq. micron.

Harigaya et al. EP 1260973 in example 1 teaches a substrate with a 0.74 micron pitch groove coated with a 68 nm ZnS-SiO_2 lower protective layer, a 16 nm GeMnSbTe recording layer, a 10 nm 77% ZrO_2-3% Y_2O_3-20% TiO_2 upper interfacial layer and a 140 nm Ag reflective

layer. [0142-0149]. This was initialized with a laser power of 850 mW at a linear velocity of 3 m/s and a feed of 36 microns/r [0152]. The laser beams used was a 196 x 1 micron oval laser beam and each area was irradiated and average of 5.4 times (area being 153 μm^2) [0152]. The use of the medium at 17.5 m/s is disclosed [0152].

It would have been obvious to one skilled in the art to modify example 2 of Onaki et al. JP 2002-260283 by using CaO, MgO and or ReO based upon the direction at [0019,0068,0078,0090] and using the initialization process of Ebina et al. JP 10-055539 with a reasonable expectation of being able to initialize the media at velocities of 8-12 m/s at power densities of 15-20 mW/ μm^2 based upon the similarity with the media of Nobukuni et al. '407 or Harigaya et al. EP 1260973 which are disclosed as functioning at higher velocities as well. Further it would have been obvious to modify the process by using CaO, MgO and or ReO in combination with ZrO_2 and up to 20% TiO_2 based upon the direction at [0019]. Note that Ebina et al. JP 10-055539 teaches the recording media can be used at velocities of 3-12 m/s with embraces the value taught for Onaki et al. JP 2002-260283.

The addition of Onaki et al. JP 2002-260283 addresses the arguments by the applicant based upon ZrO_2 dielectric layers.

The claims require the following structure, a substrate, a first/lower protective layer, a recording layer, a second/upper protective layer and a reflective layer, with a ZrO_2 oxide layer between the recording layer and either or both of the protective layers. As the layer 5 nm thick $(ZrO_2)_{80}$ $(Nb_2O_5)_{20}$ layer of Onaki et al. JP 2002-260283 is between the recording layer and the ZnS- Nb_2O_5 lower protective layer, the layer structure is met by the cited example 2 and with the substitutetion renedered obvious by the teachings at [0019,0068,0078,0090] of Onaki et al. JP

2002-260283, the composition and layered structure is taught. To argue that the $(ZrO_2)_{80}$ $(Nb_2O_5)_{20}$ layer is not an oxide layer as on page 8 of the response is entirely without merit (O is the atomic symbol for oxygen). The claims do not require the oxide layer on both sides of the recording layer, so the upper protective layer composition is moot. The basis for the ratios being maintained is that of disclosed equivalence, such as at [0019,0068,0078,0090] of Onaki et al. JP 2002-260283. It would be ridiculous to assert or assume changes in the ratios without a specific teaching to that effect. The use of higher linear velocities is taught by Ebina et al. JP 10-055539 and Nobukuni et al. '407 and has the simple advantage of being able to iniaitlize the media is less time than slower velocities and the ranges taught by Ebina et al. JP 10-055539 and Nobukuni et al. '407 provide a reasonable expectation of success, noting that these teachings are within the phase change optical recording media arts and therefore analogous. Ebina et al. JP 10-055539 teaches the velocities of 3-12 m/s [0009] as well as the use of power densities of 7.5-20 mW/ μm^2 [0010] and so these features are taught, contrary to the position of the applicant on pages 10 and 11. The rejection stands.

6. Claims 1,2,4-6, and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onaki et al. JP 2002-260283, in view of Ebina et al. JP 10-055539 (machine translation enclosed), combined with (Nobukuni et al. '407 or Harigaya et al. EP 1260973), further in view of Maeda et al. '375.

Maeda et al. '375 disclose the initialization of phase change recording media in only the groove or land areas.

In addition to the basis above, to address the embodiments bounded by the claims where multiple irradiation does not occur, the examiner holds that it would have been obvious to one

skilled in the art to modify the processes rendered obvious by the combination of Onaki et al. JP 2002-260283, Ebina et al. JP 10-055539, Nobukuni et al. '407 or Harigaya et al. EP 1260973 by initializing only the land or groove regions as taught by Maeda et al. '375 to reduce the time required for initialization.

The examiner does not assert that Maeda et al. '375 teaches the irradiation conditions, but teaches the irradiation of only the portions of the recording layer which are to be used, specifically the land or the groove areas, rather than initializing the entire media, only approximately ½ of the recording layer would be initialized, so this represents a clear time savings of approximately ½ the initialization time required to initialize the entire medium surface. The rejection stands.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Martin J Angebranndt
Primary Examiner
Art Unit 1795

11/16/2007